APPENDIX A
SELECTED ARIZONA SURFACE WATER QUALITY STANDARDS

Narrative and numeric surface water quality standards are established in the Arizona Administrative Code R18-11-101 through 123, including Appendix A and B (revised 2002). A complete copy of these standards can be obtained through the Secretary of State's Office or downloaded from their web site at: http://www.azsos.gov/public_services/table_of_contents.htm.

The abridged version provided in this appendix includes the numeric standard used in this assessment, but excludes many human-made compounds (e.g., volatile and semi-volatile organic compounds and pesticides) and it does not include the list of surface waters and designated uses.

PARAMETER	FRACTION	DESIGNATED USE (Or Site-Specific Standard)	ACUTE OR SINGLE SAMPLE MAXIMUM CRITERIA	CHRONIC CRITERIA
Ammonia (NH_3)	Total	A&Wc/A&Ww	Varies by pH., see published standards	Varies by temperature and pH, see published standards
Antimony (Sb)	Dissolved	A&Wc/A&Ww	88 µg/L	30 µg/L
		A&Wedw	1,000 µg/L	600 µg/L
	Total	DWS	6 µg/L	NA
		FBC/PBC	560 µg/L	NA
		FC	4,300 µg/L	NA
Arsenic (As)	Dissolved	A&Wc/A&Ww/A&Wedw	360 µg/L	190 µg/L
		A&We	440 µg/L	NA
	Total	DWS/FBC	50 µg/L	NA
		AGL	200 µg/L	NA
		PBC	420 µg/L	NA
		FC	1450 µg/L	NA
		AGI	2,000 µg/L	NA
		People's Canyon Creek	20 µg/L	NA
Barium (Ba)	Dissolved	FBC/PBC	98,000 µg/L	NA
	Total	DWS	2,000 µg/L	
Beryllium (Be)	Dissolved	A&Wc/A&Ww/A&Wedw	65 µg/L	5.3 µg/L
	Total	DWS	4 µg/L	NA
		FC	1,130 µg/L	NA
		PBC/FBC	2,800 µg/L	NA
Boron (B)	Total	DWS	630 µg/L	NA
		AGI	1,000 µg/L	
		FBC/PBC	126,000 µg/L	
Cadmium (Cd)	Dissolved	A&W	Varies by hardness*, see published standards.	Varies by hardness*, see published standards.
	Total	DWS	5 µg/L	NA
		FC	84 µg/L	
		AgI/AgL	50 µg/L	
		FBC/PBC	700 µg/L	
Chlorine (total residual) (Cl)	Total	A&Wc/A&Ww/A&Wedw	11 µg/L	5 µg/L
		DWS	700 µg/L	NA
		FBC/PBC	140,000 µg/L	NA

PARAMETER	FRACTION	DESIGNATED USE (Or Site-Specific Standard)	ACUTE OR SINGLE SAMPLE MAXIMUM CRITERIA	CHRONIC CRITERIA
Chromium (Cr)	Dissolved	West Fork Little Colorado River, above Government Springs Oak Creek and West Fork Oak Creek	10 µg/L 5 µg/L	
	Total	DWS/FBC/PBC AgI/AgL	100 µg/L 1,000 µg/L	NA NA
Chromium III (Cr III)	Dissolved	A&Ww/A&Wc/A&We/A&Wedw	Varies by hardness*, see published standards.	Varies by hardness*, see published standards.
	Total	DWS FC FBC/PBC	10,500 µg/L 1,010,000 µg/L 2,100,000 µg/L	NA NA NA
Chromium VI (Cr VI)	Dissolved	A&Wc/A&Ww/A&Wedw/ A&We	16 µg/L 34 µg/L	11 µg/L NA
	Total	DWS FC FBC/PBC	21 2,000 µg/L 4,200 µg/L	NA NA NA
Copper (Cu)	Dissolved	A&Ww/A&Wc/A&We/A&Wedw	Varies by hardness*, see published standards.	Varies by hardness*, see published standards.
		Rio de Flag below WWTP outfall	36 µg/L	
	Total	AgL DWS/FBC/PBC AgI	500 µg/L 1,300 µg/L 5,000 µg/L	NA NA NA
Cyanide (Cn)	Total	A&Wc A&Ww/A&Wedw A&We AgL, DWS FBC/PBC FC	22 µg/L 41 µg/L 84 µg/L 200 µg/L 28,000 µg/L 215,000 µg/L	5.2 µg/L 9.7 µg/L NA NA NA NA
Dissolved Oxygen (DO)	Total	A&Ww A&Wc A&Wedw (In compliance is percent saturation is > 90%)	>6.0 mg/L >7.0 mg/L >3.0 mg/L (3 hours after sunrise) >1.0 mg/L (at sunset)	NA NA NA
	Total	West Fork Little Colorado Peoples Canyon Creek Cienega Creek Bonita Creek	no decrease due to discharge	
DDE (metabolite of DDT)	Total	AgI, AgL, FC DWS A&Wc A&Ww, A&Wedw A&We FBC/PBC	0.001 0.1 1.1 µg/L 1.1 µg/L 1.1 µg/L 4.1	NA NA 0.001 0.02 NA NA
Escherichia coli	Total	FBC PBC	235 CFU/100ml 576 CFU/100ml	Geometric mean standard, using 4 consecutive samples: FBC = 126 CFU/100 ml PBC = 126 CFU/100 ml
Fluoride (F)	Total	DWS FBC/PBC	4,000 µg/L(4 mg/L) 84,000 µg/L(84 mg/L)	NA NA
Lead (Pb)	Dissolved	A&Ww/A&Wc/A&We/A&Wedw	Standard varies by water hardness*, see published standards	Standard varies by hardness*, see published standards.
	Total	DWS/ FBC/PBC AgL AgI	15 µg/L 100 µg/L 10,000 µg/L	NA NA NA

PARAMETER	FRACTION	DESIGNATED USE (Or Site-Specific Standard)	ACUTE OR SINGLE SAMPLE MAXIMUM CRITERIA	CHRONIC CRITERIA
Manganese (Mn)	Total	DWS AgI FBC/PBC People's Canyon Creek, Burro Creek, and Francis Creek	980 µg/L 10,000 µg/L 196,000 µg/L 500 µg/L	NA NA NA NA
Mercury (Hg)	Dissolved	A&Wc/A&Ww A&Wedw A&We	2.4 µg/L 2.6 µg/L 5.0 µg/L	0.01 µg/L 0.2 µg/L NA
	Total	FC DWS AgL FBC/PBC	0.6 µg/L 2 µg/L 10 µg/L 420 µg/L	NA NA NA NA
Nickel (Ni)	Dissolved	A&W	Varies by hardness*, see published standards.	Varies by hardness*, see published standards.
	Total	DWS FC FBC/PBC	140 µg/L 4,600 µg/L 28,000 µg/L	NA NA NA
Nitrate (as nitrogen) (NO3)	Total	DWS San Pedro (Curtiss-Benson) FBC/PBC	10 mg/L 10 mg/L 2,240 mg/L	NA NA NA
Nitrite/Nitrate (as nitrogen) (NO_2/NO_2)	Total	DWS	10 mg/L	NA
Nitrite (as nitrogen) (NO_2)	Total	DWS FBC/PBC	1 mg/L 140 mg/L	NA NA
Nitrogen (N)	Total	See nutrient chart below		
pH		A&W/FBC/PBC/AgL DWS AgI All waters except Unique Waters Unique Waters: Bonita Creek, Cienega Creek, West Fork Little Colorado, Oak Creek, and West Fork Oak Creek	6.5 - 9.0 5.0 - 9.0 4.5 - 9.0 Maximum change due to discharge = 0.5 No change due to discharge	
Phosphorus (P)	Total	See nutrient chart below		
Selenium (Se)	Total	A&Ww/A&Wc AgI A&We A&Wedw AgL/DWS FBC/PBC FC	20 µg/L 20 µg/L 33 µg/L 50 µg/L 50 µg/L 7,000 µg/L 9,000 µg/L	2 µg/L NA NA 2 µg/L NA NA NA
Silver (Ag)	Dissolved	A&Ww/A&Wc/A&We/A&Wedw	Standard varies by water hardness*, see published standards.	Standard varies by hardness*, see published standards.
	Total	DWS FBC/PBC FC	35 µg/L 7,000 µg/L 107,700 µg/L	NA NA NA
Suspended Sediment Concentration	Total	A&Wc, A&Ww (streams only – at or near base flow)	Geometric mean (4 sample minimum) 80 mg/L	
Sulfides (S2)	Total	A&W	100 µg/L(0.1 mg/L) applies only in upper layer in a lake	NA
Temperature		A&Wc	1.0 ° C	

PARAMETER	FRACTION	DESIGNATED USE (Or Site-Specific Standard)	ACUTE OR SINGLE SAMPLE MAXIMUM CRITERIA	CHRONIC CRITERIA
(maximum increase due to discharge)		A&Ww/A&Wedw Bonita Creek, Cienega Creek, West Fork Little Colorado, and People's Canyon	3.0 ° C no increase due to discharge	NA
Thallium (Tl)	Dissolved	A&Wc/A&Ww/A&Wedw	700 µg/L	150 µg/L
	Total	DWS FC FBC/PBC	2 µg/L 7.2 µg/L 112 µg/L	NA
Total Dissolved Solids (TDS)	Total	Colorado River below Hoover Dam below Parker Dam at Imperial Dam	NA	(flow-weighted average annual) 723 mg/L 747 mg/L 879 mg/L
	Total	West Fork Little Colorado River, Bonita Creek, & Cienega Creek	no increase due to discharge	NA
Turbidity	Total	Oak Creek Peoples Canyon Creek Cienega Creek Bonita Creek	3 NTU change due to discharge 5 NTU change due to discharge 10 NTU 15 NTU	NA
	Total	Former Standards A&Wc (lakes and streams) A&Ww (lakes) A&Ww and A&Wedw (streams)	Former standards 10 NTU 25 NTU 50 NTU	
Uranium (Ur)	Dissolved	DWS	35 µg/L	NA
Zinc (Zn)	Dissolved	A&Ww/A&Wc/A&We/A&Wedw	Varies by hardness*, see published standards.	Varies by hardness*, see published standards.
	Total	DWS AgI AgL FC FBC/PBC	2,100 µg/L 10,000 µg/L 25,000 µg/L 69,000 µg/L 420,000 µg/L	NA

*Dissolved metal standards are calculated using equations published with the surface water standards. In these equations, hardness (expressed as $CaCO_3$) cannot exceed 400 mg/L; therefore, use 400 mg/L hardness if result is greater than 400 mg/L.

NA = no applicable standards

RADIOCHEMICAL CRITERIA

Radiochemical	Designated Use	Standard (mean value)
Gross Alpha (excluding radon and uranium)	DWS	15 pCi/L
Radium-226 + Radium-228	DWS	5 pCi/L
Strontium 90	DWS	8 pCi/L
Tritium	DWS	20,000 pCi/L

SITE SPECIFIC NUTRIENT CRITERIA

	NUTRIENT	ANNUAL MEAN	90th PERCENTILE	SINGLE SAMPLE MAXIMUM
Verde River and tributaries above Bartlett Lake	Phosphorus	0.10 mg/L	0.30 mg/L	1.00 mg/L
	Nitrogen	1.00 mg/L	1.50 mg/L	3.00 mg/L
Oak Creek including West Fork (in Verde Watershed)	Phosphorus	0.10 mg/L	0.25 mg/L	0.30 mg/L
	Nitrogen	1.00 mg/L	1.50 mg/L	2.50 mg/L
Black River and Tonto Creek and their tributaries (in Salt Watershed)	Phosphorus	0.10 mg/L	0.20 mg/L	0.80 mg/L
	Nitrogen	0.50 mg/L	1.00 mg/L	2.00 mg/L
Salt River and tributaries, except Pinal Creek, from confluence of Black and White rivers to Roosevelt Lake	Phosphorus	0.12 mg/L	0.30 mg/L	1.00 mg/L
	Nitrogen	0.60 mg/L	1.20 mg/L	2.00 mg/L
Salt River below Stewart Mountain Dam to confluence with Verde River (In Salt Watershed)	Phosphorus	0.05 mg/L	NNS	0.20 mg/L
	Nitrogen	0.60 mg/L	NNS	3.00 mg/L
Roosevelt, Apache, Canyon, and Saguaro lakes Samples must be composites at 2-meter and 5-meter depth. (In Salt Watershed)	Phosphorus	0.03 mg/L	NNS	0.60 mg/L
	Nitrogen	0.30 mg/L	NNS	1.0 mg/L
Little Colorado River and tributaries above River Reservoir in Greer; South Fork Little Colorado River above South Fork Campground; and Water Canyon Creek above USFS boundary	Phosphorus	0.08 mg/L	0.10 mg/L	0.75 mg/L
	Nitrogen	0.60 mg/L	0.75 mg/L	1.10 mg/L
Little Colorado River at Apache County Road Number 124	Phosphorus	NNS	NNS	0.75 mg/L
	Nitrogen	NNS	NNS	1.80 mg/L
Little Colorado River from Amity Ditch diversion near Arizona Highway 273 to Lyman Lake (only when < 50 NTU)	Phosphorus	0.20 mg/L	0.30 mg/L	0.75 mg/L
	Nitrogen	0.70 mg/L	1.20 mg/L	1.50 mg/L
Colorado River at Mexico/US Northern International Border near Morales Dam	Phosphorus	NNS	0.33 mg/L	NNS
	Nitrogen	NNS	2.50 mg/L	NNS
San Pedro River from Curtis to Benson	Phosphorus	NNS	NNS	NNS
	Nitrogen	NNS	NNS	10 mg/L Nitrate (as N)